Virtual Environments over the Access Grid™

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Outline

- Virtual Reality
- Collaborative Virtual Environments
- The proposed toolkit
- Related work
- Advantages of this approach
- First phase
- Demo
- Future work

Virtual Reality (VR) is …

- Viewer-centered perspective
- Immersive
- High-resolution stereoscopic displays
- Interactive experiences
- Real-time (time-critical)
- Multisensory environments

Collaborative Virtual Environments

- Collaboration is more than videoconferencing
- Share computing resources AND knowledge
- Real time interaction among scientists

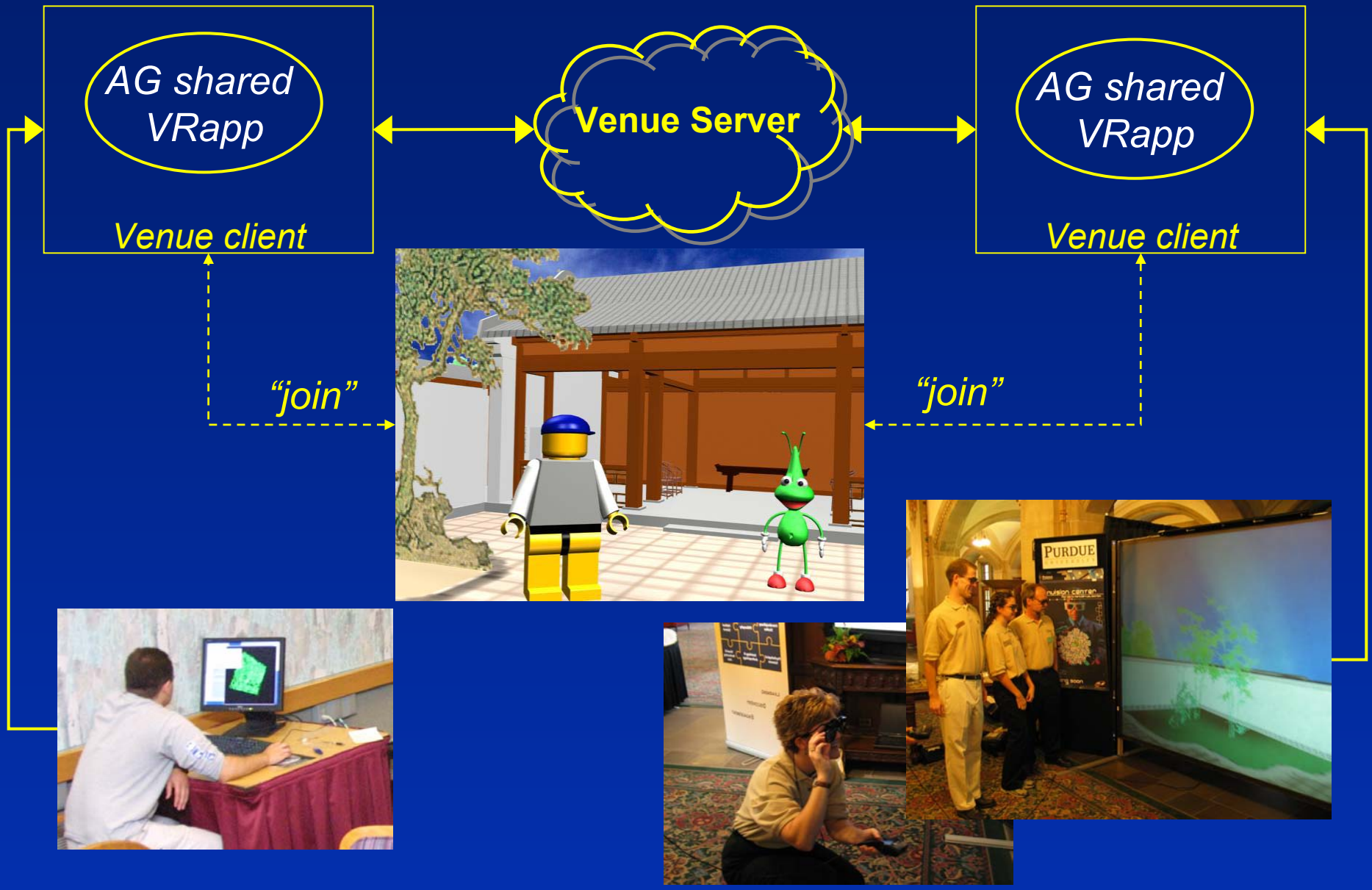
Collaborative VR: features

- Shared database
- Synchronized visualization
- Avatar representation
- Synchronized interaction

Proposed Toolkit

- Set of functions and routines to make a VR application grid enabled

Proposed Toolkit



Related work

- Augmentations to the AG (Childers et al., 2000)
- AGAVE (Leigh et al., 2001) → Geowall
- TeraVision (Leigh et al., 2002)
- Gallery on the Grid (Boston University, n.d.)
- SWoF: Scientific Workspaces of the Future (Stevens, Papka and Disz, 2003)

Related work

- Collaborative Virtual Design in Engineering (SC Global 2003 Showcase)
- Application Steering in a Collaborative Environment (Brooke et al., 2003)
- VR Node Service (Han, 2004)

Advantages of proposed approach

- Reuse by different existing applications
- Only share specific data
- Small updates – not whole video frame
- Sites can choose how to use info – “follow the leader” or use avatar
- Simple client installation (vs. Venue Server modification –Han, 2004)

Advantages of proposed approach

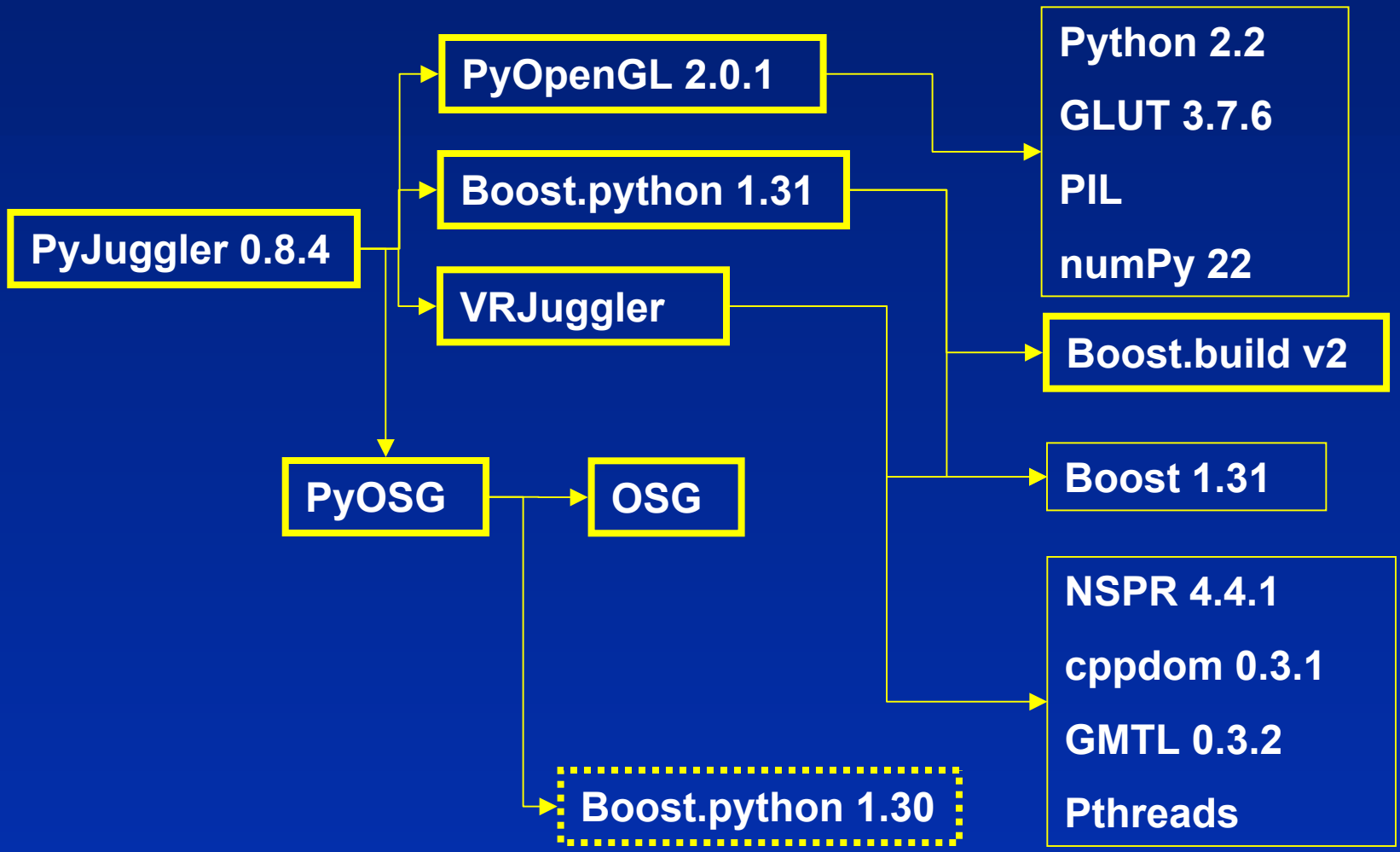
- VRJuggler
  - Multiplatform
  - Works with many graphic APIs
  - Many displays and interaction devices
  - Simulator capability
  - Open source
  - PyJuggler easily integrated with AGTk

First phase: specific apps

- Initial exploration of collaborative VR over the Access Grid™
- VRJuggler-OpenGL shared application
- Functionality similar to Shared Presentation (Judson, 2003)
- VRJuggler configuration files downloaded from the Venue Server

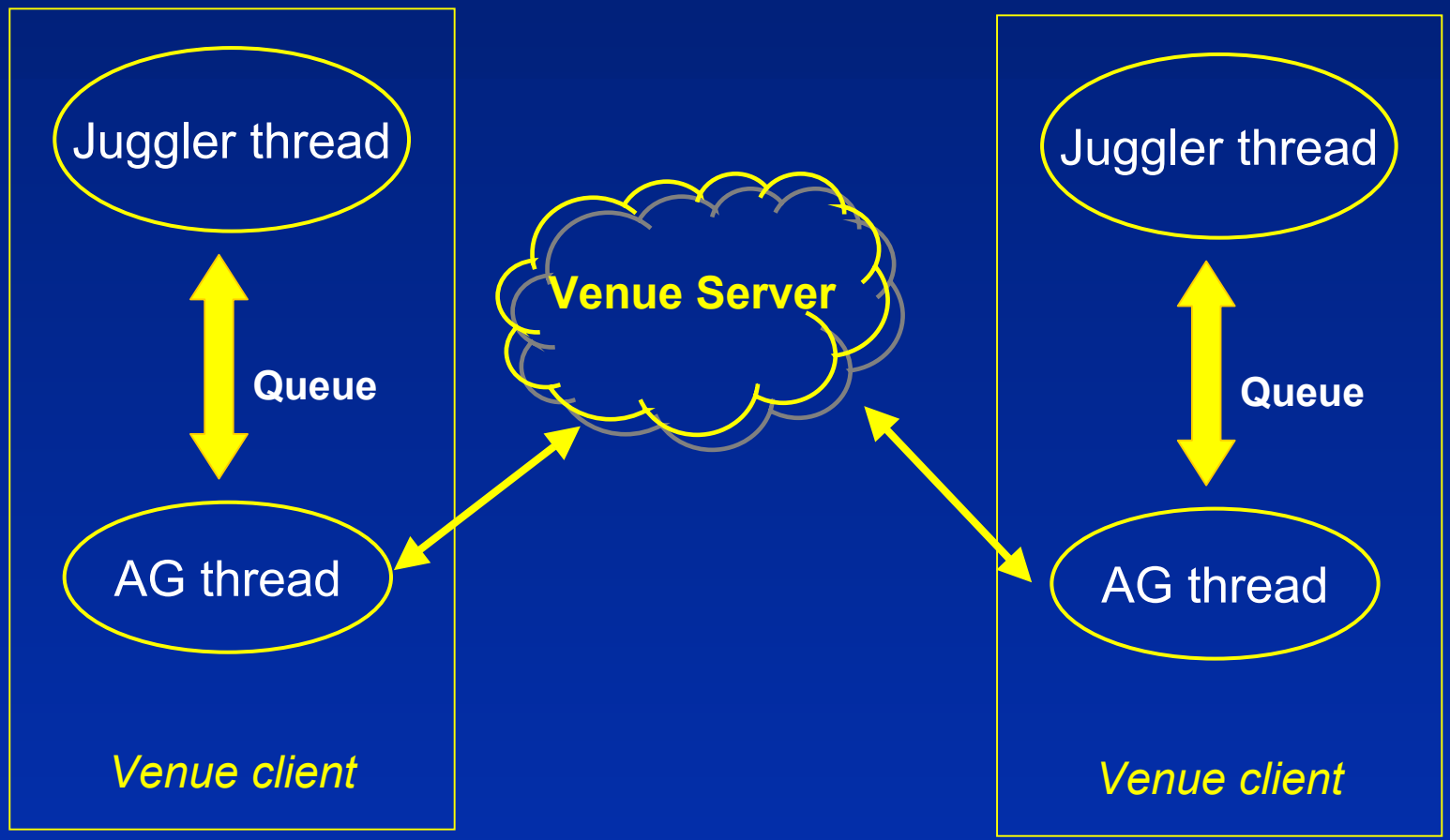
First phase: specific apps

- Many packages to build and install!



First phase: specific apps

- Threading the way through the Venue Server



DEMO

Future work

- New versions!
  Access Grid Toolkit 2.2 beta, VR Juggler 2.0 Alpha 4, PyJuggler 0.9.0 and (coming soon) OSG 0.9.7
- Integrate PyOSG
- Improve time synchronization
- … then have fun programming the toolkit

THANKS!

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